

SAIC-87/5003 & HU

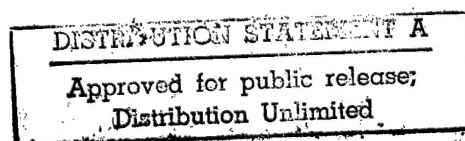
ENERGY ENGINEERING ANALYSIS PROGRAM  
MISSISSIPPI ARMY AMMUNITION PLANT  
ENERGY SAVINGS OPPORTUNITY SURVEY  
(ESOS)  
EXECUTIVE SUMMARY

PREPARED FOR:  
U.S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT

PREPARED BY:  
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## EXECUTIVE SUMMARY

This report presents the results of the Energy Engineering Analysis Program (EEAP) Study - Energy Savings Opportunity Survey (ESOS), conducted at the Mississippi Army Ammunition Plant (MSAAP) by Science Applications International Corporation (SAIC), under contract DACA01-83-C-0099. This report presents a number of projects studied, and presents information on their feasibility.

The general Scope of Work for the ESOS portion of the Army EEA program can be summarized as follows:

- 1) Review previous studies, proposals and programs that were prepared, for the need to save energy.
- 2) Perform a limited field survey to gather information so that the specified Energy Conservation Opportunities (ECO's) can be evaluated.
- 3) Update any previous ECO's that have been recommended but not implemented in accordance with latest ECIP criteria.
- 4) Determine the feasibility of the identified ECO's and prioritize them according to their cost effectiveness.
- 5) Prepare programming documentation for those ECO's that meet the Army's criteria.

- 6) Generate a report that will discuss the feasibility of the various ECO's and provide recommendations for their implementation.
- 7) Perform a special analysis of selected new projects planned for MSAAP.

In order to become familiar with MSAAP, past energy conservation reports were reviewed. Data contained in these reports were summarized for verification in the field. A list of proposed buildings to be surveyed was provided by MSAAP personnel and given a preliminary evaluation. From this evaluation, indications of the cost-effectiveness of various projects were obtained and additional data required for evaluating these projects were identified.

Field visits to MSAAP were made and a team of engineers and technicians collected data on:

- Building wall and roof construction;
- Electrical systems;
- HVAC systems; and
- Central air compressors and boilers;

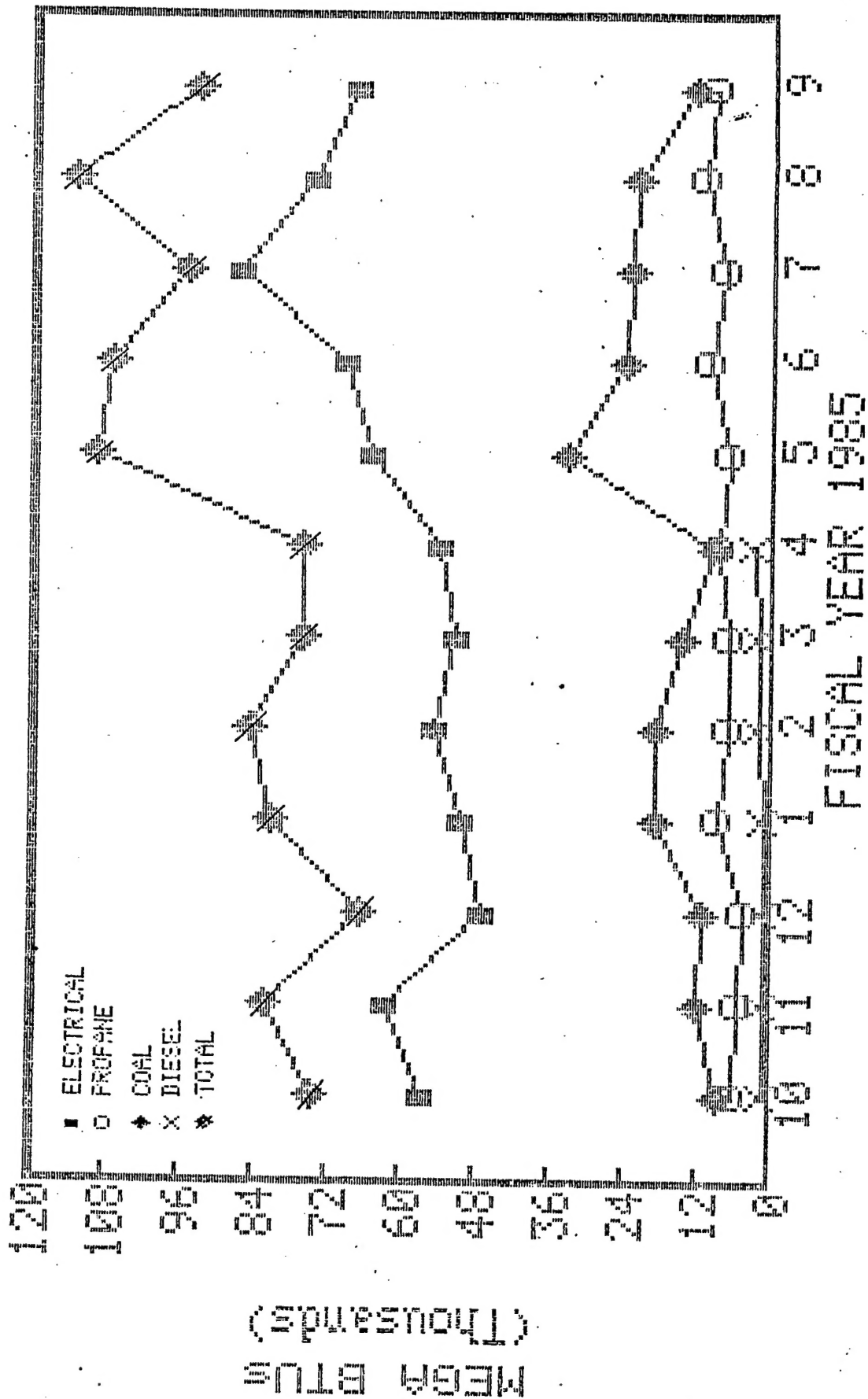
Energy usage figures for MSAAP are displayed in Figure 1 and Table 1.

After collection of the required data, the energy conservation analysis was finalized.

A summary of the results of the evaluation are presented in Figure 2, shown are those projects with a Savings-

TABLE 1  
ANNUAL ENERGY USE (MEGA BTU)

|             | <u>Building</u> | <u>Process</u> | <u>Total</u>  |
|-------------|-----------------|----------------|---------------|
| Electricity | 86,884          | 635,367        | 722,251       |
| Coal        | 14,797          | 199,614        | 214,411       |
| Propane     | <u>—</u>        | <u>96,139</u>  | <u>96,139</u> |
| TOTAL       | 101,681         | 931,090        | 1,032,801     |



ENERGY CONSUMPTION AT MSAAP

Figure 1

FIGURE 2

MISSISSIPPI ARMY AMMUNITION PLANT SUMMARY OF RECOMMENDED ECOS

| ENERGY CONSERVATION<br>OPPORTUNITY | PROJECT DESCRIPTION   | SYSTEM<br>COST | ANNUAL<br>ENERGY<br>SAVINGS<br>(MBTU) | ANNUAL<br>COST<br>SAVINGS | PAYBACK<br>(YEARS) | SIR   |
|------------------------------------|---|----------------|---------------------------------------|---------------------------|--------------------|-------|
| OFF HOURS USE OF EQUIPMENT         | REDUCE VENTILATION REQUIREMENTS DURING OFF<br>HOURS IS APPROPRIATE.   | 136800         | 50313                                 | 196880                    | 0.7                | 12.2  |
| ENERGY EFFICIENT MOTORS            | HIGH EFFICIENCY MOTORS SHOULD BE USED TO<br>REPLACE A FAILED MOTOR  | 510-7942       | 38-273                                | 16-1142                   | 32-7               | 8-7.2 |
| STEAM ORIFACE TRAPS                | INSTALL ORIFICE TYPE STEAM TRAPS ON THE<br>STEAM MAINS TO ALLOW CONDENSED WATER TO BE<br>DRAINED FROM THESE LINES.  | 16795          | 6,038                                 | 15,364                    | 1.1                | 9.4   |
| BOILER FUEL CONVERSIONS            | THE LIFE CYCLE COST OF COAL VERSE NATURAL<br>GAS OR FUEL OIL IS COMPARED TO FIND THE MOST<br>COST EFFECTIVE FUEL SOURCE. SINCE COAL HAS A<br>LOWER ENERGY COST, THERE ARE NO COST SAVINGS<br>AND THE PROJECT DOES NOT QUALIFY FOR ECIP.<br>THERE ARE HOWEVER LARGE NON-ENERGY SAVINGS<br>AND THE PROJECT HAS LESS THAN A TWO YEAR<br>PAYBACK. | 2,981,000      | 26,416                                | 423,480                   | 7.0                | .31   |
| FORGING AREA HEAT RECOVERY         | HEAT RECOVERED FROM THE FORGING AREA CAN BE<br>USED IN THE VAT CLEANING AREA.   | 244,687        | 20400                                 | 25,561                    | 9.6                | 1.2   |
| SITE DIMMING                       | ENERGY CAN BE SAVED BY DIMMING THE 400 WATT<br>HPS SITE LIGHTING. A MANUAL OVERRIDE CAN BE<br>PROVIDED SO THE SECURITY GUARDS CAN BRING THE<br>LIGHTS TO FULL BRIGHTNESS AS REQUIRED.   | 52289          | 1610                                  | 6738                      | 7.8                | 1.1   |
| REDUCE AIR FLOWS                   | THE QUANTITIES OF OUTSIDE AIR INTRODUCED<br>INTO A CONDITIONED SPACE CAN BE REDUCED TO<br>SAVE ON ENERGY.   | 233864         | 6,547                                 | 22,246                    | 10.5               | .8    |
| TOTALS                             |   | \$3,439,513    | 105,050                               | \$669,165                 |                    |       |

\* (DOES NOT QUALIFY FOR ECIP FUNDING)

Investment ratio greater than one. The documents necessary to initiate the implementation of these projects have been prepared and submitted separately. Implementation of the selected opportunities would provide a projected savings of 10.2% in energy consumed.




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